

A dark-morph White-bellied Storm Petrel *Fregetta grallaria* off Más Afuera (Alejandro Selkirk) Island, Juan Fernández archipelago, Chile?

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Here we describe an intriguing dark *Fregetta* storm petrel observed in the Juan Fernández archipelago, and discuss its possible origin. During 3–15 March 2013, we mounted a research expedition to the Juan Fernández archipelago (Shirihai *et al.* in press), especially designed to study *Pterodroma* petrels at sea, as part of the Tubenoses Project & Extreme Gadfly Petrel Expeditions (Shirihai & Bretagnolle in prep.). Special foci of our research trips are studies of plumage variation, the pelagic distribution, foraging techniques and species associations, and in this case the birds' return to the breeding island of Más Afuera (Alejandro Selkirk). As far as we know, our expedition was the first of its type in the waters of the archipelago since the Brewster-Sanford Expedition, in December 1913, and the visit by Rollo Beck, in January 1914 (Murphy 1936), who collected petrels by using chum to attract them. During the c.1,800 km voyage, we targeted 12 strategic 'mass chumming' locations, with each session lasting 2–6 hours. Chumming was performed for a total 42.5 hours, using c.1 ton of frozen chum blocks, with each of the 70 blocks used comprising 10–15 kg of fish cuts, which we coupled on the sea surface with very dense fish oil. En route to and from the archipelago, the expedition also conducted chumming in the Humboldt Current, at the point where the continental shelf gives way to deeper waters.

Between 6 and 12 March 2013, we worked at sea around Robinson Crusoe and Más Afuera, mostly to the east, south and south-west of the islands (Shirihai *et al.* in press). The last chumming session off Más Afuera was on 12 March, at 13.30–17.30 h (33°53'11"S, 80°41'24"W; c.8.3 nautical miles south-west of the island), which resulted in ten tubenose species, including 5,000 Juan Fernández *Pterodroma externa* and 100 Stejneger's Petrels *P. longirostris*, attending the chum. We observed just two *F. grallaria* which fed constantly within the core of the chum slick, often close to our boat. During much of this period, HS was using only a Canon 1Dx camera and 300mm/2.8 lens, when, at c.16.00 h, he spotted a very small and apparently all-dark storm petrel that crossed between the main chum slick and the rear of the boat. When HS spotted the bird it was just 5 m from the boat, and he acquired a series of 12 sharp but small-sized images (*cf.* Figs. 1–2). Amazingly, notwithstanding that the chum slick was proving so attractive to other petrels, including two *F. grallaria*, this bird completely ignored the chum and continued until it was out of sight—it was not seen again.

We possibly saw another individual on 9 March while chumming off Más Afuera, although it could not be photographed. However, it looked very similar in coloration, structure and behaviour to the bird on 12 March.

Description

Size.—During the entire observation, the impression was of a tiny storm petrel, clearly smaller (at least in appearance) than *F. grallaria*, although they were not seen side-by-side, rather only flew close to one another. During the previous week, HS & HADM had seen up to 30 *F. grallaria* per day, so they had a good sense of comparative sizes at sea. Their impression was that it was not much larger than a Grey-backed Storm Petrel *Garrodia nereis*,



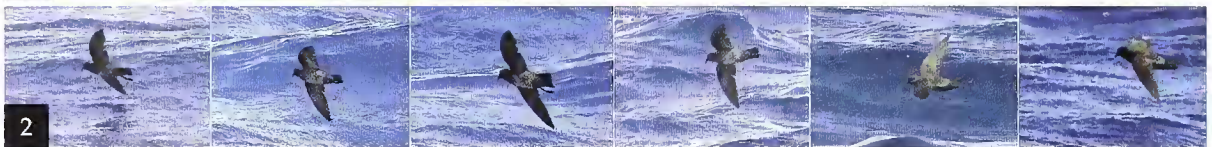
Figure 1. Dark White-bellied Storm Petrel *Fregetta grallaria*, off Más Afuera, Juan Fernández archipelago, 12 March 2013 (Hadoram Shirihai, © Tubenoses Project)

Figure 2. Flight sequence of dark White-bellied Storm Petrel *Fregetta grallaria*, off Más Afuera, Juan Fernández archipelago, 12 March 2013 (Hadoram Shirihai, © Tubenoses Project)

Figures 3–4. Depending on angle and flight mode, feet do not seem to project beyond the tail tip when seen from above, but just slightly from below; dark White-bellied Storm Petrel *Fregetta grallaria*, off Más Afuera, Juan Fernández archipelago, 12 March 2013 (Hadoram Shirihai, © Tubenoses Project)

Figure 5. Dorsal view of dark White-bellied Storm Petrel *Fregetta grallaria*, off Más Afuera, Juan Fernández archipelago, 12 March 2013 (Hadoram Shirihai, © Tubenoses Project)

Figure 6. Ventral view of dark White-bellied Storm Petrel *Fregetta grallaria*, off Más Afuera, Juan Fernández archipelago, 12 March 2013 (Hadoram Shirihai, © Tubenoses Project)





Figures 7–8. Dark White-bellied Storm Petrel *Fregetta grallaria* (left); White-bellied Storm Petrel *F. g. segethi* (right, a rather fresh adult in early stage of breeding, not a fresh juvenile, due to mixed feather ages with worn tips on back, and thus unlike the worn and moulting dark bird); both off Más Afuera, Juan Fernández archipelago, 12 March 2013 (Hadoram Shirihai, © Tubenoses Project)

or intermediate in size between the latter and local *F. g. segethi*, which is among the smallest population of White-bellied Storm Petrel (Brooke 2004).

Jizz and structure.—The bird appeared very compact and round-bodied (Fig. 3), its overall shape apparently closest to Grey-backed Storm Petrel. Most of the time (and on most images) the feet did not project beyond the tail tip, but at certain angles (and in two of the 12 photographs) the feet seem to project just slightly (Fig. 4). The tail mostly appeared square-and straight-ended (e.g., Fig. 5) or to have a very shallow fork (Fig. 6).

Behaviour.—Similar brief approaches to chum (almost ignoring it) have been reported at certain times or localities by storm petrel species otherwise easily attracted to chum elsewhere, e.g. Matsudaira's Storm Petrel *Oceanodroma matsudairae* wintering over the Seychelles Bank (Shirihai & Skerrett in prep.) and 'Titan' Storm Petrels *F. grallaria titan* in French Polynesia (cf. Howell 2014). Thus, behaviour towards the chum or boats is not a guide to taxon, despite that it is often considered as a subsidiary clue in field guides.

Plumage

Overall dark above, with pale (creamy, marbled grey) 'U'-shaped rump patch. The latter was rather ill-defined and lacked any contrast, being relatively narrow (c.1/3 width of tail length; Fig. 5). Back and upperwing-coverts appeared darker than rest of the upperwing, while the head and mantle, plus throat to chest were darkest, almost dusky or ashy black (Figs. 5–6). Underparts also appeared mostly dark, but darkest were the chest and undertail-coverts/vent area, while the belly was paler, marbled whitish grey, with buffish-washed flanks (Fig. 6). Most of the underwing-coverts (including all lesser and median primary- and secondary-coverts) were solidly and contrastingly black, encompassing almost half of the underwing area; the greater-coverts (primary- and secondary-coverts, including the longer inner feathers near the body) were paler, forming a narrow dusky-grey panel between the blackish fore underwing-coverts patch and the otherwise dark remiges (Fig. 6).

Moult in relation to breeding cycle

As shown in, e.g., Fig. 7, the bird was in advanced moult, with numerous fresh and old (bleached brownish and worn) body feathers, had already shed the innermost primary, with a growing remex (already $c.2/3$ grown), while the other primaries were heavily worn and bleached (some with broken / ragged tips). There were also apparent moult limits among the rectrices and secondaries, with the latter's outermost block appearing clearly blacker (newer) and the inner ones browner (older), visible both above (Fig. 7) and below (Fig. 6). If these moult contrasts are real then the bird must have been an adult or immature (second-year or older) that had completed at least one previous moult cycle (prior to the present one). If an adult, such a pattern suggests that the bird had just finished or was about to finish breeding (presumed summer–autumn breeder). But, if the apparent moult contrasts in the tail and secondaries are artefacts, this bird might be a pre-breeding immature, i.e. first-year bird. Without more data on breeding cycles and moult timing, it is impossible to relate the observed pattern to any breeding season or population. Nevertheless, none of the other White-bellied Storm Petrels (e.g., Fig. 8) observed during the expedition had such advanced moult, rather all were fresh or only slightly / moderately worn, suggesting that they were just starting to breed or in the middle of their cycle (presumed autumn–winter breeders).

Discussion

We believe that the bird photographed represents a 'dark morph' or 'dark form' in the *F. grallaria* complex. Its relationships to the local population of the Juan Fernández archipelago (*F. g. segethi*) merit comment, as the bird concerned appears rather similar to dark-morph *F. grallaria* from Lord Howe Island. HS was unable to identify a single plumage difference from the latter.

No almost all-dark *Fregatta* has ever been recorded in the Juan Fernández archipelago, while no dark morph of *F. g. segethi* (which breeds on the Desventuradas Islands and the Juan Fernández) is known from museum collections or at-sea observations (e.g., Murphy 1936, Bourne 1983, 2014, Brooke 2004, Spear & Ainley 2007, Howell 2012; W. R. P. Bourne pers. comm., B. Robertson pers. comm.). Furthermore, in agreement with, for example, Murphy & Snyder (1952), Brooke (2004) and Spear & Ainley (2007), HS's previous work has revealed that only nominate *grallaria* shows such extreme dimorphism in plumage, with a wholly / mostly dark morph, which is confined to Lord Howe Island, and intermediate-patterned birds in the Kermadec Islands (pers. obs.; Bell *et al.* 1984, Tennyson & Taylor 1990). Furthermore, *Fregatta* around Tristan da Cunha, in the South Atlantic, also present some limited polymorphism, with some being dark-rumped, thus showing tendency towards Lord Howe birds (Howell 2012).

The bird appeared distinctly smaller with notably more advanced moult than any of the local *F. g. segethi* present. Earlier moult suggests earlier breeding. Irrespective of the bird's origin, there is already some evidence of seasonal populations of *F. grallaria* in the Juan Fernández. For instance, on Santa Clara (off Robinson Crusoe), fresh eggs have been found in January and fledglings in June (Brooke 2004), but also chicks of various ages in January (Murphy 1936).

It is interesting to note that there were very few *F. grallaria* around Más Afuera in March 2013, where the dark bird was seen, with the vast majority (90%+) of *F. g. segethi* observed during our field work being east of the oceanic ridge between Robinson Crusoe and Más Afuera, and the largest concentrations around the former or up to 50 nautical miles to the east. Similarly, in May 1983, Bourne (2014; W. R. P. Bourne pers. comm.) observed 24 *F. grallaria* off Robinson Crusoe, but none off Más Afuera. In the Juan Fernández, at least in

recent decades, breeding by *F. grallaria* has only been proven on Santa Clara (Murphy 1936, Brooke 2004).

To conclude, we consider two possible scenarios to explain the origin of the bird we observed. 1. A vagrant dark morph from Lord Howe (nominate *grallaria*), which is the most parsimonious conclusion, given its identical plumage and that these islands are the only locality from which such plumage is known. If so, the bird had wandered at least 10,500 km from its breeding site (straight-line distance from Lord Howe to Más Afuera). The possibility of an aberrant individual seems very remote as the paler mottling on the belly and rump match the dark morph exactly. 2. The possibility that the Juan Fernández support a dark-plumaged *Fregetta*, perhaps representing a distinct population. However, until (and if) more such birds can be documented at sea and breeding is proven, it will be impossible to confirm the identity of the bird we observed. More chumming work, as well as nocturnal trapping, on the Juan Fernández might elucidate the status of this dark storm petrel.

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